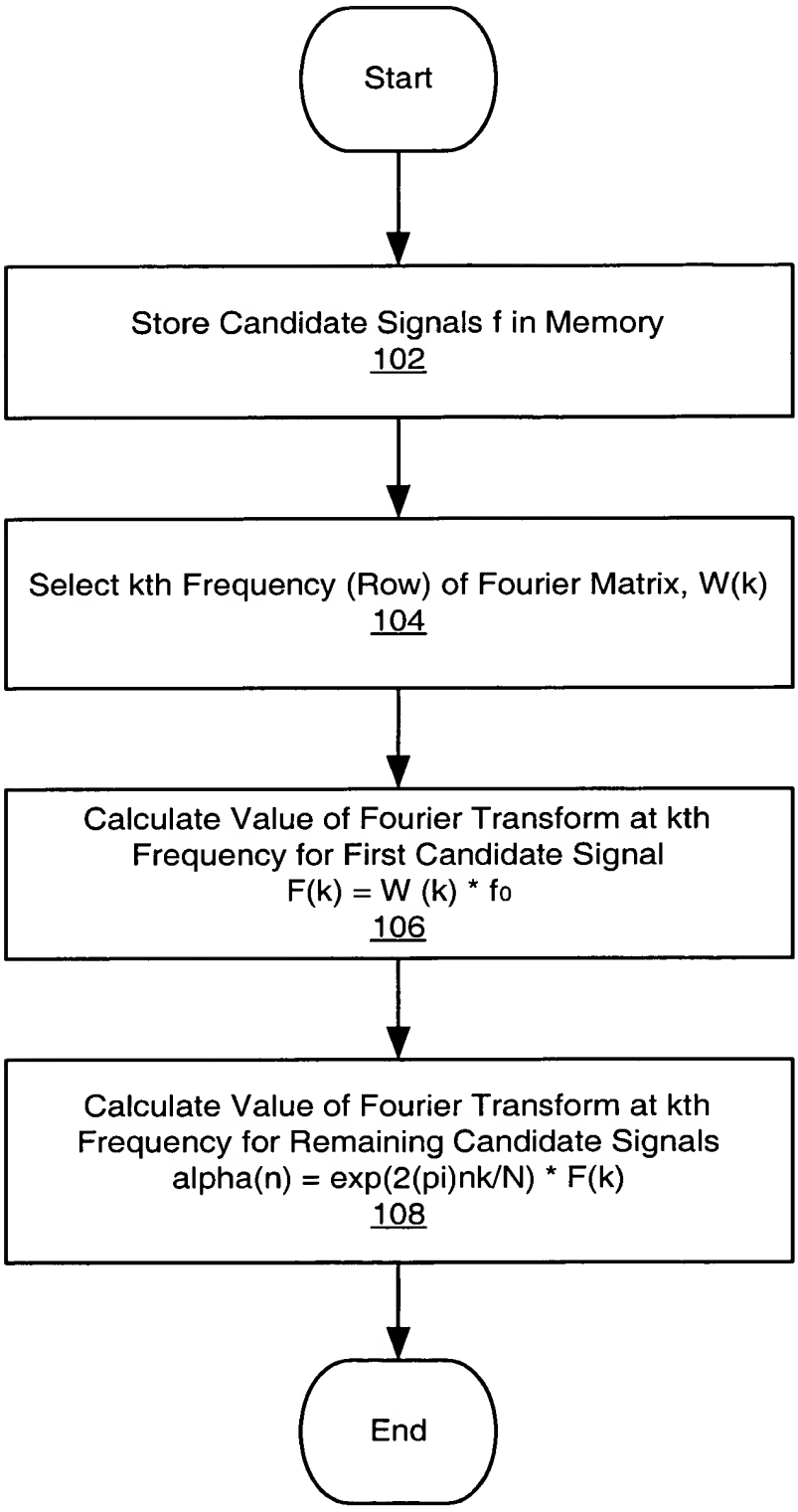


Figure 1A (Prior Art)

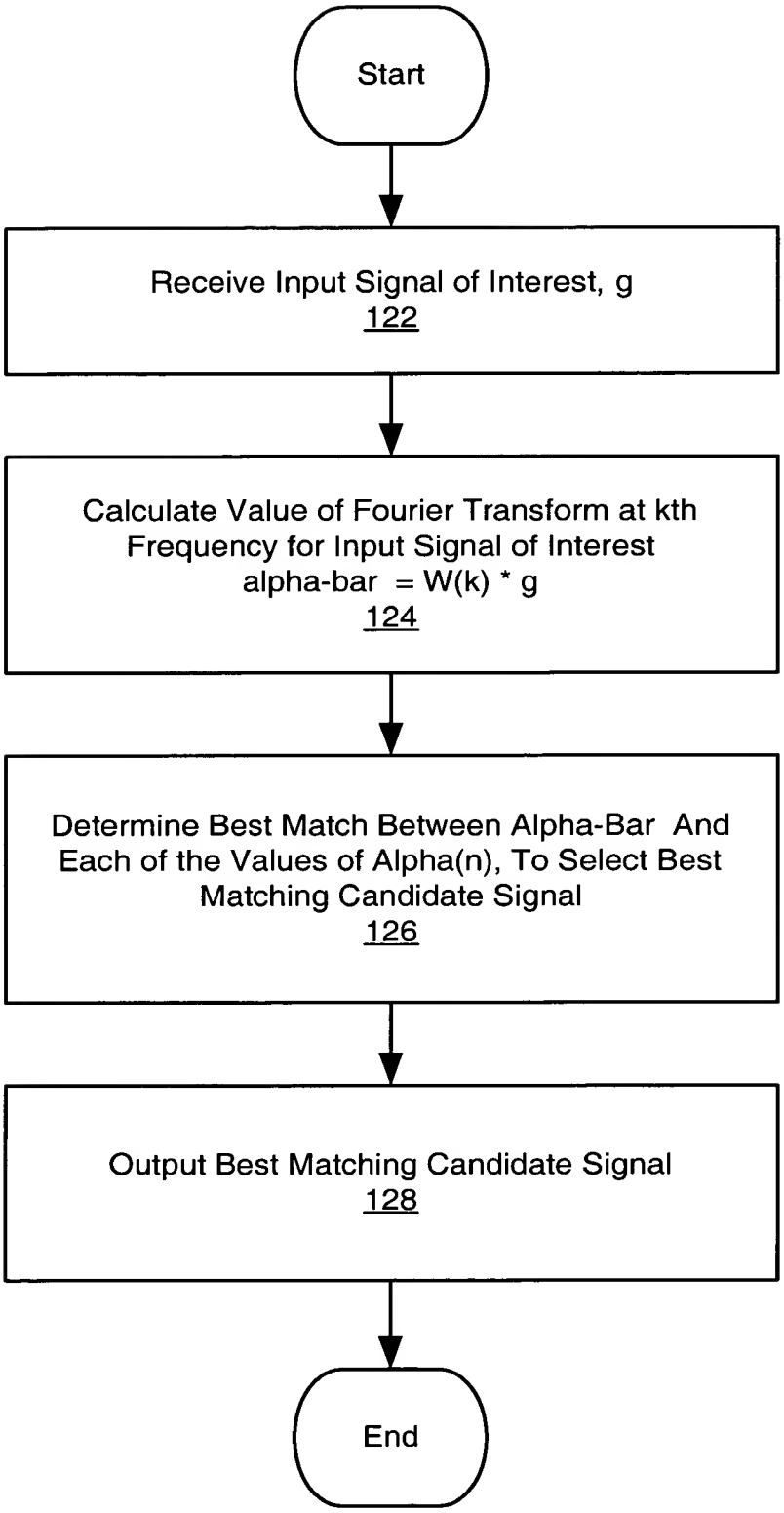
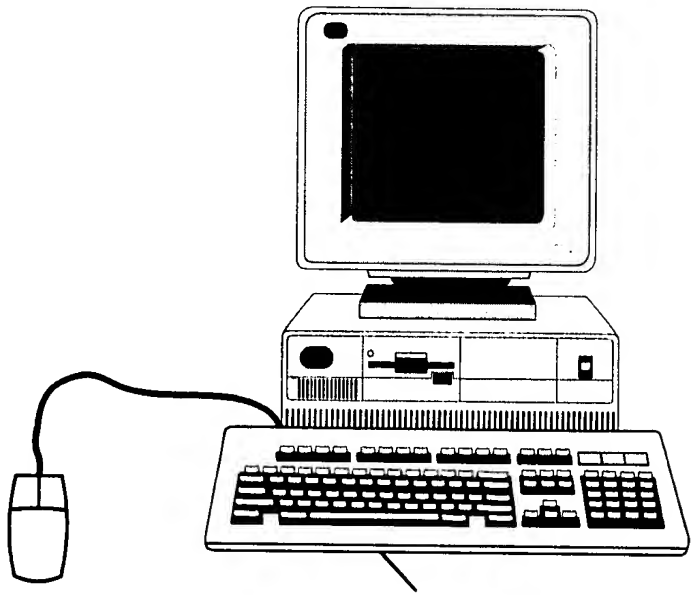


Figure 1B (Prior Art)

FOREIGN 2500960



Host Computer System
202

Figure 2

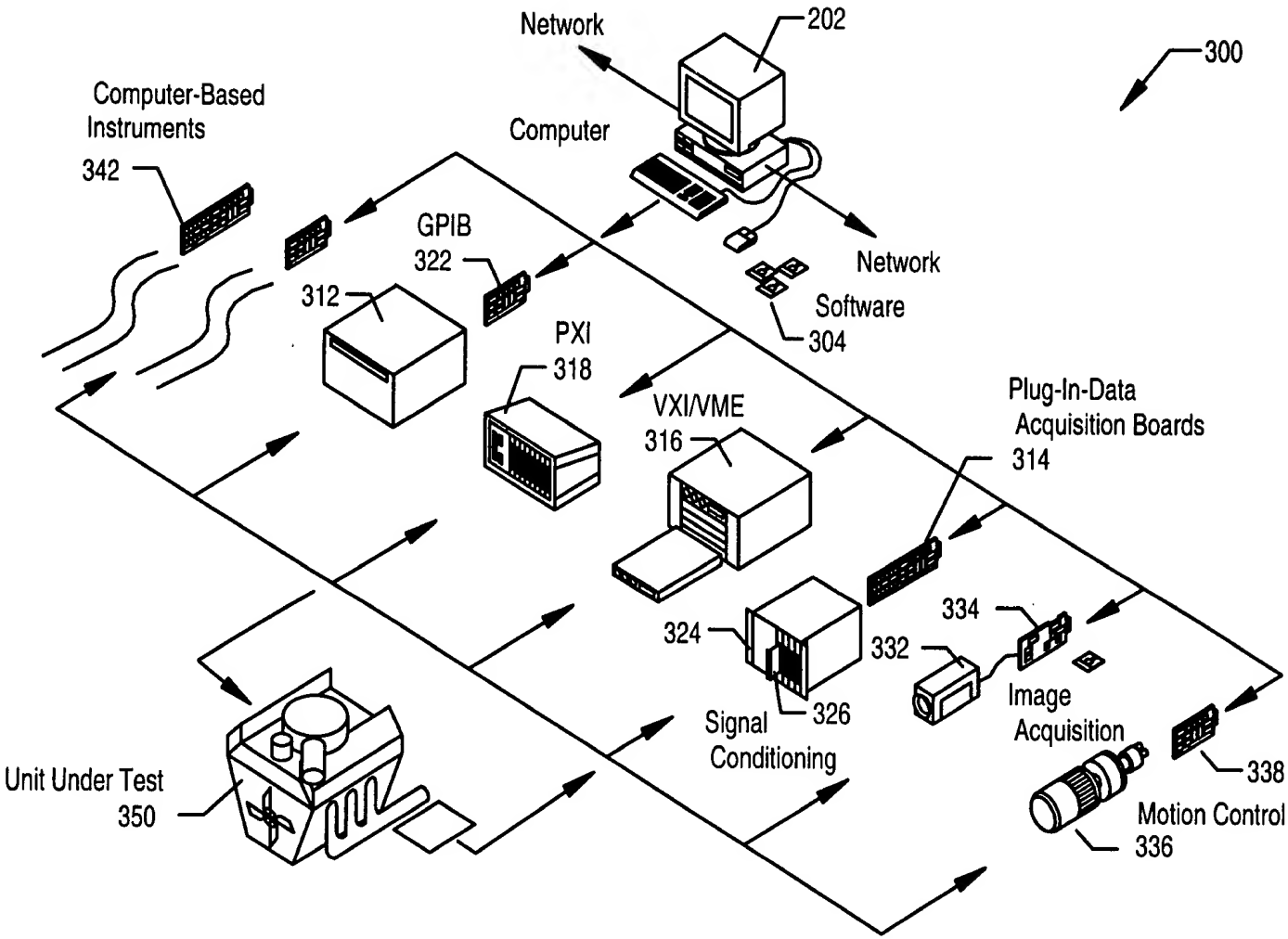

Network
202
300
Computer-Based
Instruments
342
Computer
GPIB
322
312
Network
Software
304
PXI
318
VXI/VME
316
Plug-In-Data
Acquisition Boards
314
334
324
332
Image
Acquisition
Signal
Conditioning
326
338
Motion Control
336
Unit Under Test
350

FIG. 3A

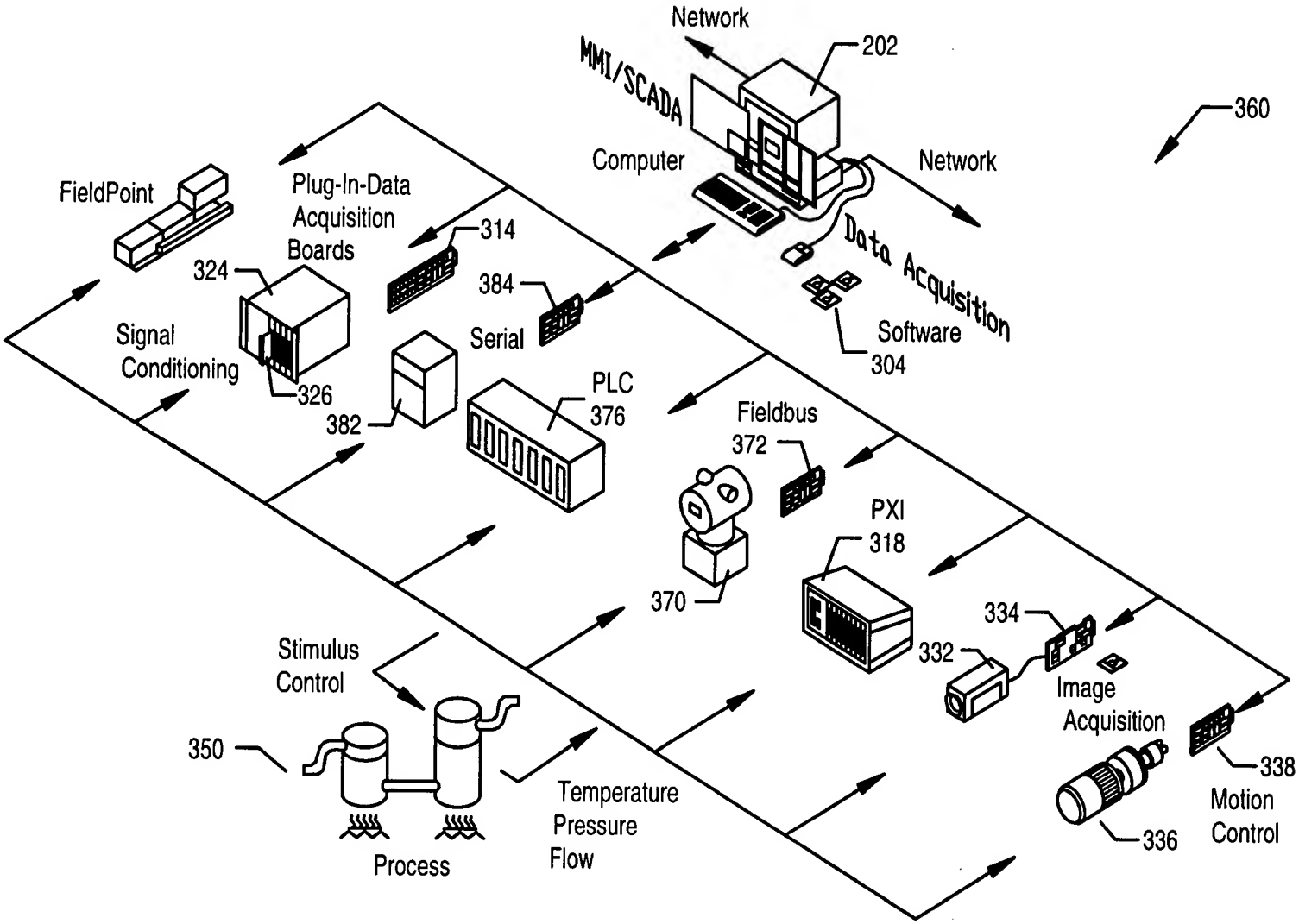

Network
202
MMI/SCADA
Computer
Network
360
Data Acquisition
Software
304
FieldPoint
Plug-In-Data
Acquisition
Boards
314
324
384
Signal
Conditioning
326
Serial
382
PLC
376
Fieldbus
372
PXI
318
370
334
332
Image
Acquisition
Stimulus
Control
350
338
Motion
Control
336
Temperature
Pressure
Flow
Process

FIG. 3B

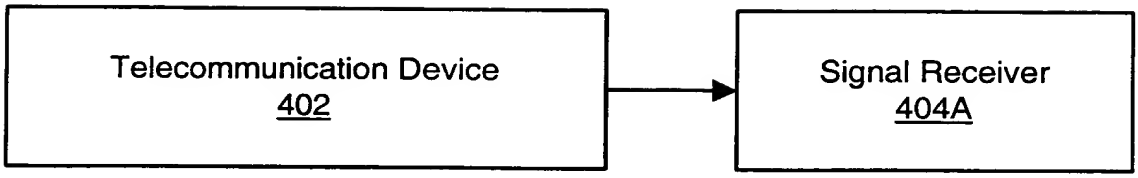


Figure 4A

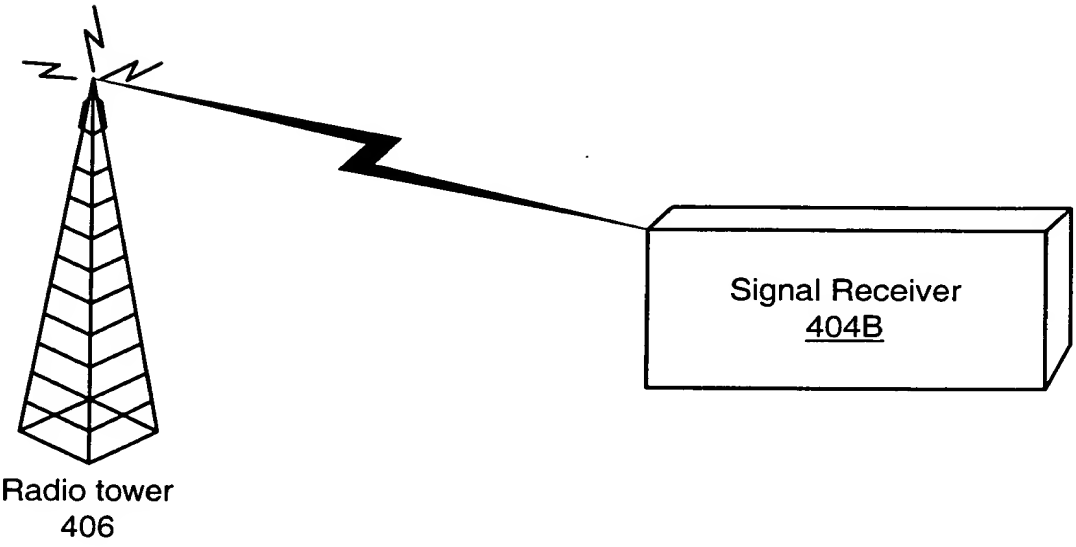


Figure 4B

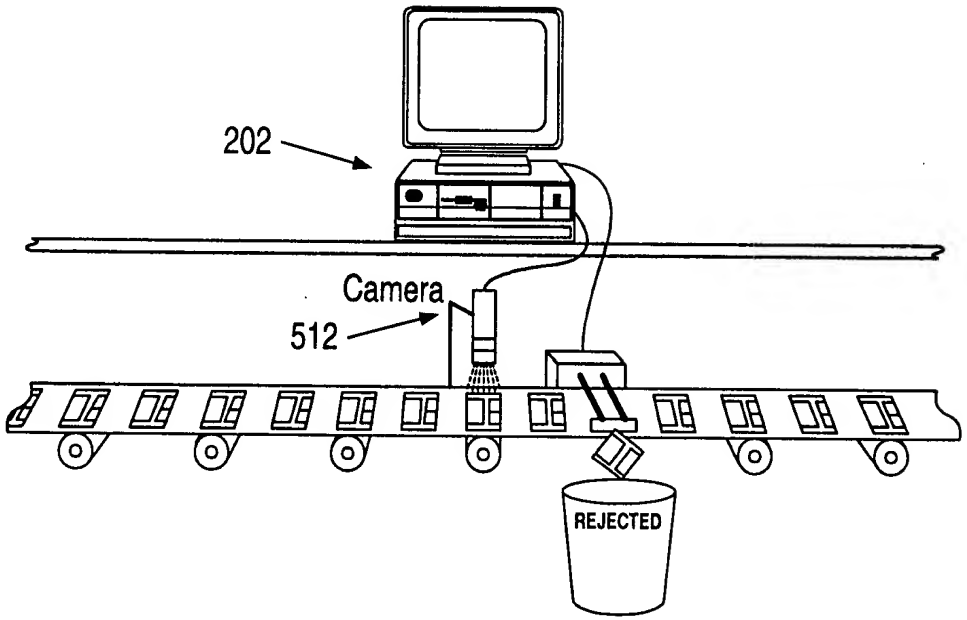


Figure 5

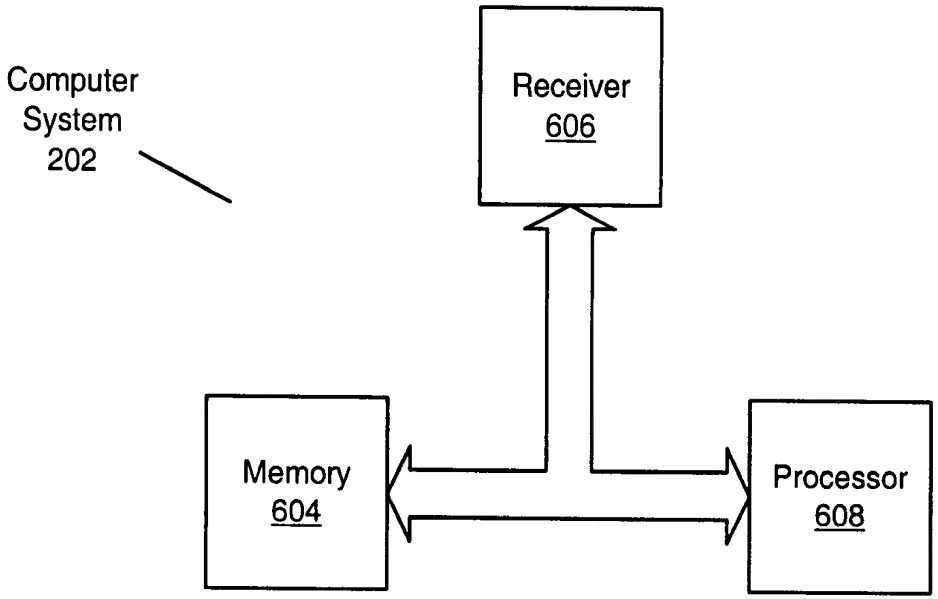


Figure 6

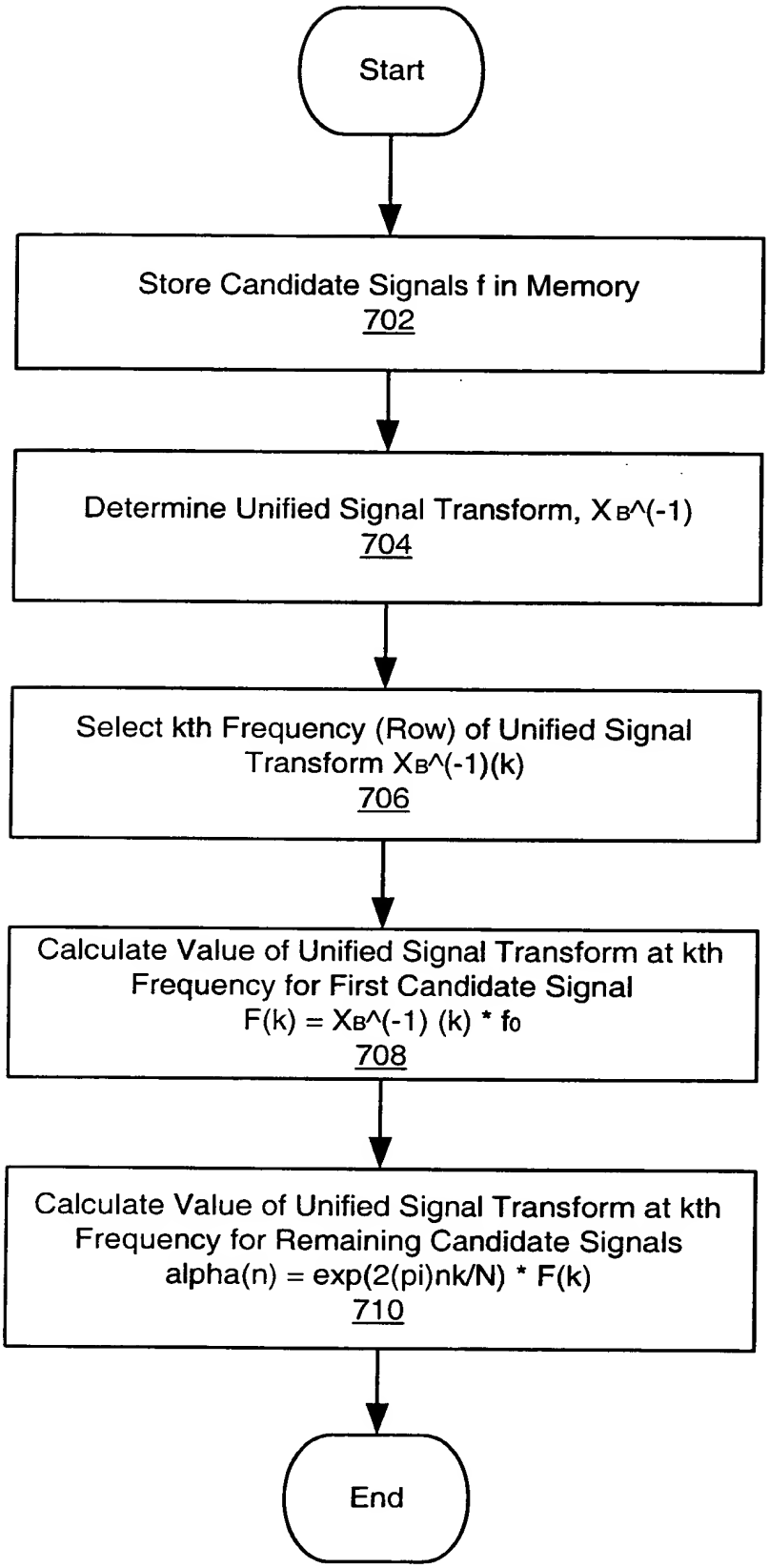

Start
Store Candidate Signals f in Memory
702
Determine Unified Signal Transform, XB^(-1)
704
Select kth Frequency (Row) of Unified Signal Transform XB^(-1)(k)
706
Calculate Value of Unified Signal Transform at kth Frequency for First Candidate Signal
F(k) = XB^(-1) (k) * f0
708
Calculate Value of Unified Signal Transform at kth Frequency for Remaining Candidate Signals
alpha(n) = exp(2(pi)nk/N) * F(k)
710
End

Figure 7A

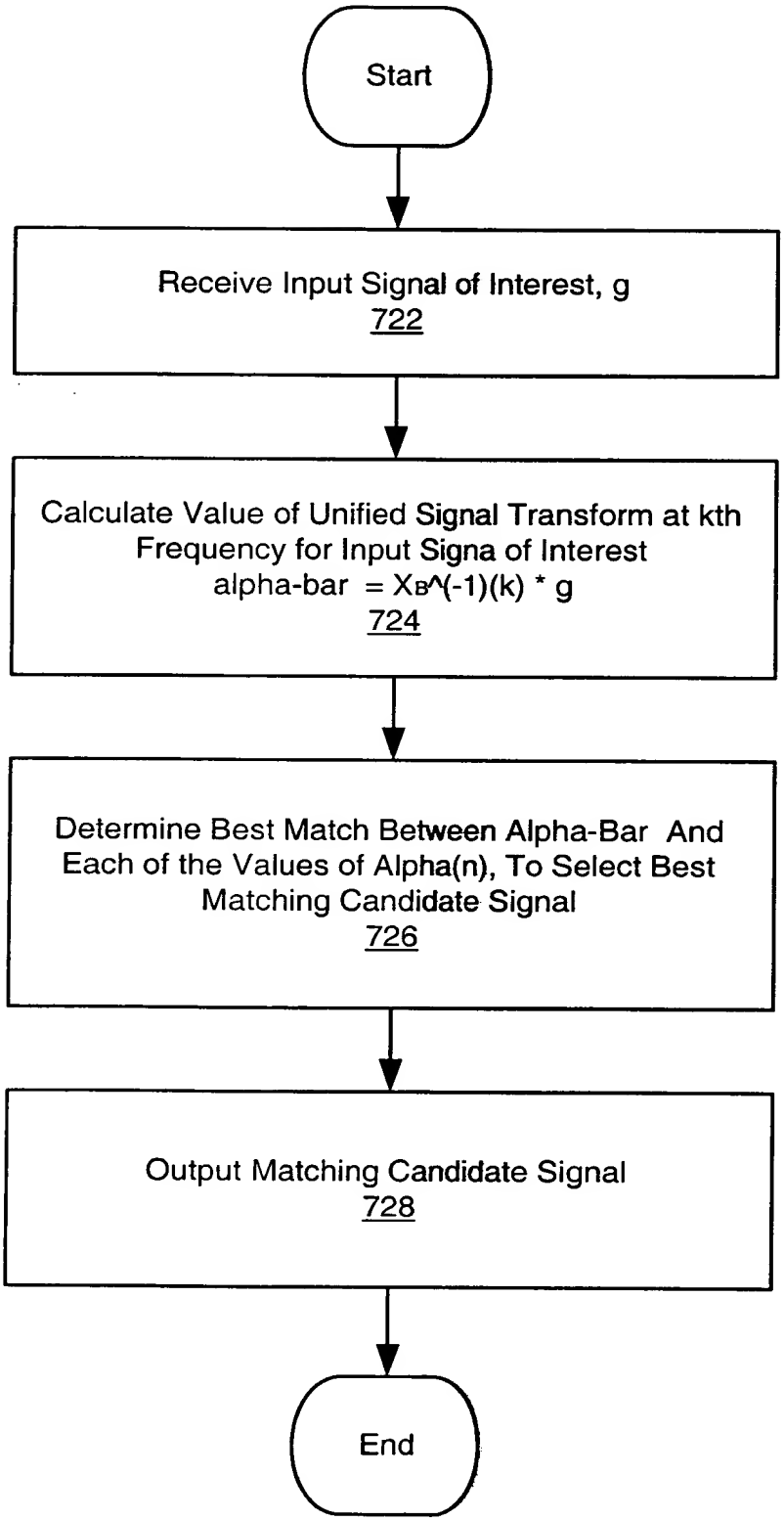

Start
Receive Input Signal of Interest, g
722
Calculate Value of Unified Signal Transform at kth Frequency for Input Signa of Interest
alpha-bar = XB^(-1)(k) * g
724
Determine Best Match Between Alpha-Bar And Each of the Values of Alpha(n), To Select Best Matching Candidate Signal
726
Output Matching Candidate Signal
728
End

Figure 7B

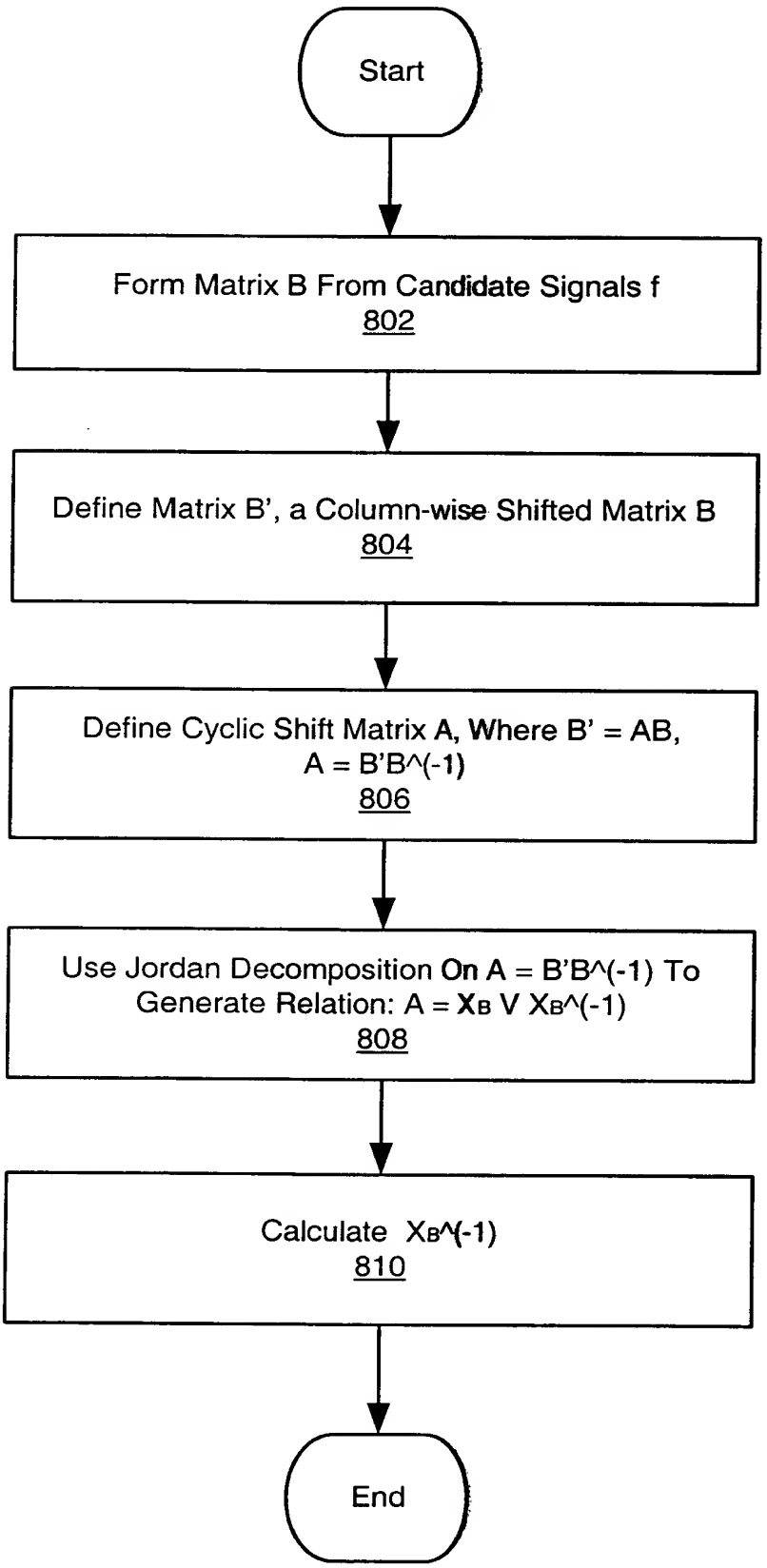
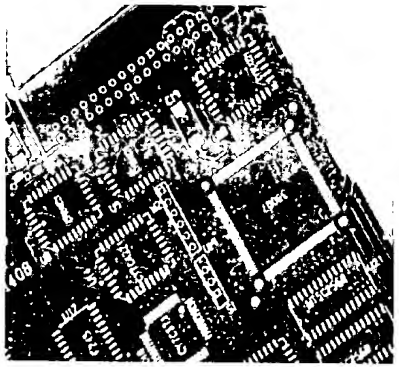
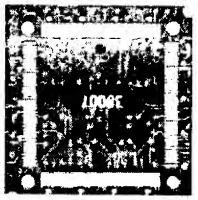

Start
Form Matrix B From Candidate Signals f
802
Define Matrix B', a Column-wise Shifted Matrix B
804
Define Cyclic Shift Matrix A, Where B' = AB,
A = B'B^(-1)
806
Use Jordan Decomposition On A = B'B^(-1) To
Generate Relation: A = XB V XB^(-1)
808
Calculate XB^(-1)
810
End

Figure 8



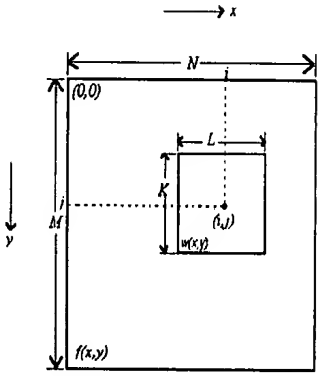
Test Image *I*
902

Figure 9A



Template
Image, It
904

Figure 9B



Classic Correlation
906

Figure 9C
(Prior Art)

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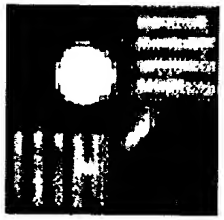
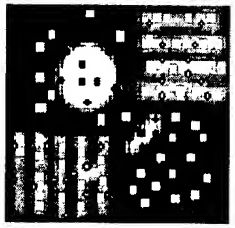
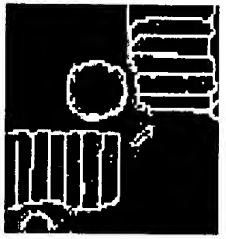


Reference Pattern
1002



Sampled Pattern
1004

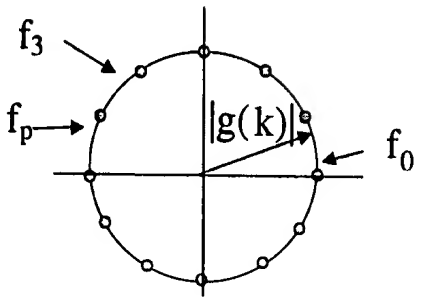


Edges Information
1006

Shift Invariant Pattern Matching

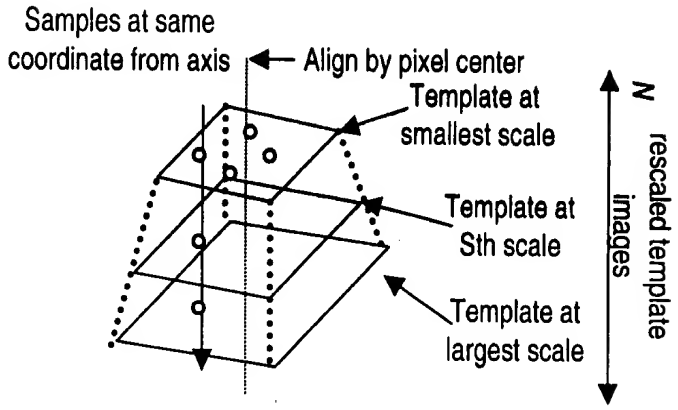
Figure 10

FOITO 25009760



UST Circle
1102

Figure 11A



Pattern Matching Sampling Strategy
1104

Figure 11B